During his 25 years of practicing in the Central Valley, Dr. Bradley T. Wajda (aka "Dr. Brad") has amassed extensive experience in adult and child psychiatry, as well as comprehensive substance abuse treatment. Catch "Dr. Brad" at RadioPsyched.com. You can also read more from "Dr. Brad" at EsanoHealth.com.

Ripples through time:

Post-Traumatic Stress Disorder and epigenetics

by Bradley T. Wajda, D.O.

Post-traumatic stress disorder is a type of anxiety disorder that occurs after seeing or experiencing a traumatic event that involved the threat of injury or death. War, natural disaster, terrorism and violence in society have made PTSD (Post Traumatic Stress Disorder) a mental health diagnosis that is frequently mentioned in the media.

This issue of Central California Life devotes considerable attention to the Armenian genocide, an event that has had wide-ranging repercussions for millions of people with familial ties to the tragedy. As has been documented by writer Monica Prinzing and others elsewhere, some individuals appear to suffer PTSD symptoms linked to the genocide despite having directly experienced it. How can this be? First, a discussion of PTSD is in order. Then, I'll look at the medical profession's current understanding of nature and nurture, and how they shape our psychological and behavioral tendencies.

PTSD

While the symptoms of PTSD have been around for centuries, the medical community has been slow to recognize it. It wasn't until 1980 that the American Psychiatric Association officially added PTSD as a diagnosis. Throughout history, PTSD has been called a number of different names. Most of these names were associated with the one traumatic event that resulted in the highest concentration of PTSD: war. It was called "soldier's heart" during the Civil War, "shell shock" during World War I and "battle fatigue" during World War II.

Throughout my career I have been asked one question more than any other: "Doc, was I born this way...or did I just get this way?"

The cause of PTSD is unknown and can occur at any age. It is not known why traumatic events cause PTSD in some people but not in others. In the U.S., 7-8 percent of people will develop PTSD in their lifetime. Five million people suffer from PTSD at any one time and women are twice as likely as men to develop PTSD. The numbers are much higher for children who have seen a parent killed or been sexually abused.

The symptoms of PTSD fall into three main categories: re-experiencing, avoidance and hyperarousal. Re-experiencing the event occurs through "flashbacks" where the event seems to be happening again; recurring and intrusive memories of the event; nightmares of the trauma; and strong, uncomfortable reactions to situations that remind you of the event. Avoidance causes feelings of detachment and can result in an inability to remember important aspects of the trauma, a lack of interest in normal activities, avoidance of things or thoughts that remind you of the event, and feeling like you have no future. Also, it is not uncommon to feel guilt about the event (including "survivor guilt"). Hyperarousal causes an exaggerated startle response, hypervigilance or outbursts of anger.

Throughout my career I have been asked one question more than any other: "Doc, was I born this way...or did I just get this way?" The question of nature or nurture – biology or psychology – has been long debated. I've seen abused children who are adopted by nurturing parents seemingly defy every effort to soothe them. Likewise, I've seen children orphaned by nurturing parents and placed in very dysfunctional situations to which they seem to immune. The converse to both of these scenarios also happens regularly.

So is there an answer? The medical profession (especially psychiatry) has embraced the term "familial" to categorize those genetic outcomes in people that don't conform to what was expected. Let's look at an example. In identical twins, a genetically related illness should be present in both twins 100 percent of the time. Schizophrenia occurs 1 percent of the time in the general population. So if one twin has schizophrenia, then the other should have it 1 percent of the time or 100 percent of the time. In fact, they have it 51 percent of the time. The "familial" label can certainly apply here.

EPIGENETICS

What if there's a provable answer that includes both nature and nurture?

That answer is called epigenetics. The origins for its application to psychology began in 1992 in a Madrid bar over a beer between Moshe Szyf, a molecular biologist and geneticist at McGill University in Montreal, and Michael Meaney, a McGill neurobiologist.

Originally, it was thought that changes to our DNA only occurred during fetal development. The science that was to be called epigenetics discovered that dietary changes and chemical exposure after birth could alter DNA by adding a methyl group (a small cluster of carbon with hydrogen atoms) to the DNA, essentially interfering with which genes get transcribed and passed on to offspring. This means that, without a mutation to the DNA code itself, the attached methyl groups cause long-term and inheritable changes in one's genetic make-up.

Szyf and Meaney began to wonder if, similar to diet and chemical exposure, psychological trauma could also set off epigenetic changes to a person's DNA. They ended up doing a series of elaborate experiments that culminated in a landmark paper published in the June 2004 issue of the journal Nature Neuroscience.

Subsequent studies revealed that stress, especially early stress during childhood, adds methyl groups to DNA without making changes to the genetic code. However, this does change which genetic traits get passed down. According to the new insights of behavioral epigenetics, traumatic experiences in our past, and in our recent ancestors' pasts, leave molecular scars adhering to our DNA. The DNA remains the same, but psychological and behavioral tendencies can be inherited by their offspring.

Recent research findings suggest that most epigenetic changes are erased rather than being passed on to offspring, but this erasure is imperfect. This means that some of the affected genes do make it through to the next generation – the scars actually do alter the genes that are passed on. Relevant to the topic of the Armenian genocide, the psychological ripples of that trauma persist but (thankfully) dissipate with each succeeding generation.

It is important to realize that these psychological traits are as likely to be positive as they are to be negative. In other words, you may be enjoying traits gained by your grandmother through exemplary nurturing during her childhood. The research has always supported that a mother's love can make all the difference in a child's life- long before the concept of epigenetics.

Medical science is looking at drug treatments that could reset these epigenetic changes. This has been aptly described by using the analogy of your grandmother's vintage dress- you can wear it as is or have it altered using these medications (if and when they are fully developed). So back to the question of "Is it nature or nurture?" The answer is "yes". ●